In the claims:

Following is a complete set of claims as amended with this Response.

1.   (Currently Amended) A method comprising:

receiving a packet at a network device, the packet including a header and a payload;

tagging the packet, by a first packet-processing application of a plurality of packet-processing applications, with a cache lookup key based upon original contents of the header, the cache lookup key indicating where in a unified cache a cache entry corresponding to the packet will be stored, the first packet-processing application modifying the header of the packet;

the first packet-processing application initiating a second packet-processing application of the plurality of packet-processing applications and providing the tagged packet to the second packet processing application; and

those of the plurality of packet-processing applications attempting to access the cache entry from the unified cache subsequent to the tagging by the first packet-processing application using the cache lookup key rather than generating a new cache lookup key based upon current contents of the header.

2.   (Original) The method of claim 1, wherein said tagging the packet with a cache lookup key comprises populating a lookup key field of an internal packet descriptor corresponding to the packet with a hash value.

3.   (Original) The method of claim 2, wherein the packet comprises an Internet Protocol (IP) packet and the cache lookup key is based upon a source IP address of the header, a destination IP address of the header, a source port of the header, a destination port of the header, and a protocol value in the header.

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4.   (Original) The method of claim 1, wherein the plurality of packet-processing applications includes applying one or more of Network Address Translation (NAT), packet filtering, and packet routing.

5.   (Original) The method of claim 4, wherein the plurality of packet-processing applications are distributed among two or more processors of the network device.

6.   (Currently Amended) The method of claim 1, wherein the first packet-processing application comprises a NAT process ~~that modifies the header of the packet, and wherein the method further comprises the NAT process initiating a second packet-processing application of the plurality of packet-processing applications and providing the tagged packet to the second packet-processing application~~.

7.   (Original) The method of claim 6, further comprising the second packet-processing application updating the cache entry with information specific to the second packet-processing application by using the cache lookup key to access the cache entry.

8.   (Currently Amended) A method comprising the steps of:

a step for determining whether a cache lookup key is present in a packet descriptor associated with a received packet;

a step for performing a lookup in a unified cache with the cache lookup key if it is determined that the cache lookup key is present in the packet descriptor;

a step for creating a new cache entry in the unified cache based upon information in a header of the received packet and tagging the packet if it is determined that the cache lookup key is not present in the packet descriptor or the lookup does not locate an appropriate existing cache entry;

<u>a step for conveying the cache lookup key from a NAT packet-processing task to a packet filtering packet-processing task;</u> and

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a step for updating an existing cache entry with module-specific information.

9.   (Original) The method of claim 8, wherein the unified cache is implemented as a hash table and tagging the packet comprises generating a hash value based upon at least a source address and a destination address in the header and storing the hash value in the packet descriptor.

10.   (Original) The method of claim 8, wherein the unified cache is utilized by a plurality of distributed packet-processing tasks including Network Address Translation (NAT), packet filtering, and packet forwarding.

11-21. (Cancelled)

22.   (Currently Amended) A machine-readable medium having stored thereon data representing instructions that, if executed by one or more processors of a network · device, cause the one or more processors to:

receive a packet including a header and a payload;

tag the packet, by a first packet-processing application of a plurality of packet-processing applications, with a cache lookup key based upon original contents of the header, the cache lookup key indicating where in a unified cache a cache entry corresponding to the packet will be stored; the first packet-processing application modifying the header of the packet;

the first packet-processing application initiating a second packet-processing application of the plurality of packet-processing applications and providing the tagged packet to the second packet processing application; and

use the cache lookup key rather than generating a new cache lookup key based upon current contents of the header by those of the plurality of packet-processing applications attempting to access the cache entry from the unified cache subsequent to the tagging by the first packet-processing application.

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23.   (Original) The machine-readable medium of claim 22, wherein tagging the packet with a cache lookup key comprises populating a lookup key field of an internal packet descriptor corresponding to the packet with a hash value.

24.   (Original) The machine-readable medium of claim 22, wherein the packet comprises an Internet Protocol (IP) packet and the cache lookup key is based upon a source IP address of the header, a destination IP address of the header, a source port of the header, a destination port of the header, and a protocol value in the header.

25.   (Original) The machine-readable medium of claim 22, wherein the plurality of packet-processing applications includes applying one or more of Network Address Translation (NAT), packet filtering, and packet routing.

26.   (Original) The machine-readable medium of claim 22, wherein the plurality of packet-processing applications are distributed among at least two processors of the network device.

27.   (Original) The machine-readable medium of claim 26, wherein the plurality of packet-processing applications include Network Address Translation (NAT), packet filtering, and packet forwarding.

28.   (Currently Amended) The machine-readable medium of claim 22, wherein the first packet-processing application comprises a NAT process that modifies the header of the packet, wherein the instructions further cause the one or more processors to:

provide the tagged packet to a second packet-processing application of the plurality of packet-processing applications; and

initiate the second packet-processing application of the plurality of packet-processing applications subsequent to the NAT process.

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29.   (Original) The machine-readable medium of claim 28, wherein the first packet-processing application comprises a NAT process that modifies the header of the packet, wherein the instructions further cause the one or more processors to:

access the cache entry, from the second packet-processing application, by using the cache lookup key; and

update the cache entry, by the second packet-processing application, with information specific to the second packet-processing application.

30.   (Original) The machine-readable medium of claim 22, wherein the unified cache is implemented as a hash table and tagging the packet comprises generating a hash value based upon at least a source address and a destination address in the header and storing the hash value in the packet descriptor.

31.   (Original) The machine-readable medium of claim 22, wherein the network device comprises a router.

32.   (Original) The machine-readable medium of claim 22, wherein the network device comprises a switch.

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